

# **A Description of Socio-cultural Effects in the Fish Trap Industry in the US Caribbean (Puerto Rico and the US Virgin Islands)**

SHIVLANI, M., VALDÉS PIZZINI, M., MURRAY, T., KIRKLEY J., SUMAN, D., J. WATERS., and J. AGAR

*Rosenstiel School of Marine and Atmospheric Science  
University of Miami  
4600 Rickenbacker Causeway  
Miami, Florida 33149 USA*

## **ABSTRACT**

As part of a National Marine Fisheries Service (NMFS) funded study, our research project examines the economic and sociocultural impacts of fish traps in the U.S. Caribbean (comprised of Puerto Rico and the US Virgin Islands). Using a random sample approach, we are conducting an extended field survey with 100 fishers in the region. Trained personnel visit all trap fishers in the field, and the sample is stratified by region and by trap total. The information collected as part of this project includes the economic status and operational efficiency within the fish trap fishery, catch and effort information, spatial use profiles (GIS), and the sociocultural parameters of the fishing communities. The study shall assist in the determination of the current status of the fishery, differences between and within island fishing communities, and the identification of displacement options resulting from natural disasters, management changes, or environmental changes in the fishery. The study's findings shall also be compared with a similar effort that we are undertaking in the South Florida lobster trap fishery, to identify convergences and differences in the two trap fisheries and their current and future management.

**KEYWORDS:** US Caribbean, Puerto Rico, US Virgin Islands, Fish Traps, Fishery Management

## **Una Caracterización de los Impactos Económicos y Sociocultural de las Nasas de Pesca en el Caribe de EEUU (Puerto Rico y Las Islas Virgenes de los EEUU)**

Como parte de un estudio financiado por National Marine Fisheries Service (NMFS), nuestro proyecto examina los impactos económicos y sociocultural de las nasas (trampas) de pesca en el Caribe de EEUU (abarcado de Puerto Rico y de las Islas Virgenes de los EEUU). Usando una muestra escogida al azar, estamos conduciendo una encuesta en el campo con 100 pescadores de la región. Personal entrenados visitan todos los pescadores en el campo, y la muestra es estratificada por la región y por total

de la nasa. La información recogida como parte de este proyecto incluye el estado económico y la eficacia operacional dentro de la industria pesquera de trampas, la información del retén y del esfuerzo, los perfiles espaciales del uso (SIG), y los parámetros sociocultural de las comunidades de pesca. El estudio asistirá a la determinación del estado actual de la industria pesquera, a las diferencias entre y dentro de las comunidades de pesca de la islas, y a la identificación de las opciones de la dislocación resultado de desastres naturales, de cambios de la gerencia, o de cambios ambientales en la pesquería. Los resultados del estudio también serán comparados con un esfuerzo similar que estamos emprendiendo en la industria pesquera de nasas de langosta en el sur de Florida, para identificar convergencias y diferencias en las dos pesquerías de nasas y su gerencia actual y futura.

**PALABRAS CLAVES:** El Caribe de EEUU, Puerto Rico, Islas Virgenes de los EEUU, nasas (trampas) de pescas, gerencia de la industria pesquera

#### INTRODUCTION TO TRAP FISHING IN THE US CARIBBEAN

Despite the advent of new fishing technologies, the fish trap fishery continues to be one of the most valuable fisheries in the US Caribbean. In recent years, the Puerto Rican fish trap fishery has produced about 22 % of the Commonwealth's total landings and 24% of its total value. Puerto Rican fish traps catch a variety of species including, spiny lobsters, shallow-water and deep water snappers, box-fishes, grunts, groupers, and triggerfish. Snapper and spiny lobster landings alone account for over 60 % of the fish trap revenue. In contrast, the US Virgin Islands fish trap (or pot) fishery accounts for approximately 37% of the Territory's total landings and its total value. US Virgin Islands' fish pots also land a variety of species including spiny lobsters, triggerfish, shallow and deep water snappers, grouper, and grunts. Spiny lobster and triggerfish landings alone account for 48 % of the pot revenues.

In recent years, federal, state and local management agencies have come under increasing pressure to regulate the fish trap fishery. Environmental groups have expressed concern because the haphazard placement and hauling of traps has been documented to damage coral heads, soft corals and sponges. In addition to physically damaging the hard corals and gorgonians, traps target various overexploited reef fish species, which further threaten the health and stability of coral reef habitats. Reef-fish species are particularly vulnerable to harvesting pressure because of their life history characteristics, which include sedentary behavior, slow growth, and delayed reproduction. Valuable species such as Nassau grouper (*Epinephelus striatus*) and goliath grouper (*Epinephelus itajara*) continue to be overexploited despite a harvesting moratorium in federal waters since 1990 and 1993, respectively.

The paucity of socio-economic data is one the major obstacles for developing and evaluating sound conservation and management proposals in the US Caribbean. Under the provisions of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), federal fishery management agencies are required to assess, specify and describe the likely effects of proposed regulations on fishermen and their communities. In deciding among

management and conservation alternatives the federal fishery management agencies is required to consider, *inter alia*, "historical fishing practices in, and dependence on, the fishery, the economics of the fishery, the capability of fishing vessels used in the fishery to engage in other fisheries, and the cultural and social framework relevant to the fishery and any affected fishing communities".

This paper discusses the salient social issues and concerns affecting the US Caribbean fish trap fishery. This information was collected systematically during the course of a recent, larger economic study of the US Caribbean fish trap fishery. The goal of the larger fish trap costs and earnings study was to characterize the economic conditions under which this industry operates. Here, we focus on island level social issues and concerns, reporting on the sociocultural effects in the US Caribbean fish trap fishery. .

## RESULTS

There are very different social issues and concerns on each island that was surveyed as part of the study, but there are also several common social themes that tie the fisheries together. Superficially, each island's fishers, and trap fishers especially, face different conditions, and these need to be described on an island-specific basis before discussing the common themes in the trap fisheries.

### Saint Thomas

Saint Thomas trap fishers face considerable socioeconomic pressures, the most important of which are related to the emergence of closed areas in the region. Already restricted to limited grounds, due to physical constraints such as the shelf break on northern and southern ends of the island and political barriers restricting fishing in the British Virgin Islands and in Puerto Rican territorial waters, trap fishers complain that now their trap fishing areas are being taken over by marine reserves. Several fishers point to the 1999 establishment of the 10,200 acre Hind Bank Marine Conservation District, which is closed to all fishing (CFMC 1999, Federal Register, November 4, 1999), and the May 2003 establishment of a Virgin Islands Coral Reef National Monument excluding fishing from much of its 12,708 acres (Federal Register April 4, 2003), and they claim that these closures have led to displacement and increased crowding.

Many fishers also believe that development is destroying the adjacent, fringing reefs, and that development-created sedimentation and pollution are the real culprits in the decline of many fish stocks. Often, fishers argue, they are made scapegoats in such issues, whereas development is allowed to proceed. Several older fishers emphasize this issue, pointing out that prior to development, many of the local ecosystems surrounding the island were in much better condition than they are presently. They offer as evidence the condition of such resources in the heavily impacted Saint Thomas contrasted with those in the lightly developed, adjacent island of Saint John.

Other issues often raised by Saint Thomas respondents include the preponderance of poaching (primarily by divers but also by other trap fishers,

especially in deeper waters), competition from recreational and other commercial fishers, the increasing cost of living on the island, and the impacts of imports (especially from the adjacent British Virgin Islands). Most fishers interviewed believe that management should focus more on enforcement and not on reducing effort. They believe that natural fish population fluctuations and hurricane events check over-expansion in the fish trap industry, and many fishers report controlling effort due to market demands as well. Consumption of so-called 'potfish' is almost entirely local, and fishers claim that their activities assist in sustaining the local culture, which imported species could not replace.

### **Saint Croix**

Social issues among trap fishers in Saint Croix are similar to those raised by fishers on Saint Thomas. Most importantly, trap fishers claim that they are being forced to fish in increasingly crowded conditions, due to area closures. Many argue that the expansion of the Buck Island National Monument and the establishment of the East End Marine Park represent immediate threats to trap fishing, and others point to the poor fishing grounds adjacent to the Cruzan Bay Rum plant and the Hess Plant refinery on the southern end of the island. In May 2003, the Department of the Interior approved the addition of 18,135 acres to the existing 880 acre Buck Island National Monument, closing an area of over 19,000 acres to fishing in the northeastern waters off Saint Croix (Federal Register April 4, 2003). The Government of the U.S. Virgin Islands established the first, local marine park in January 2003 (VICZMP 2003). East End Marine Park encompasses much of the eastern half of Saint Croix and includes three, no-take zones (on the northeastern, southeastern, and eastern sides of the island).

Many other trap fishers in the region feel that they have few other options than to continue fishing. That is, they believe that there are limited employment alternatives on the island which, unlike Saint Thomas to the north, does not attract much cruise liner tourism. Consequently, many trap fishers use other gears to supplement fish traps, including SCUBA, hook-line, and nets. Trap concentrations are much lower in Saint Croix than on the other two islands, and many trap fishers state that this is because trap fishing is part of the natural cycle in a fisher's life. Fishers, especially in Saint Croix, start out by fishing more labor-intensive gears, such as SCUBA and nets and move to hook-line and finally traps later on in life; this pattern of trap fishing is very different than what occurs in Saint Thomas, where trap fishers represent a dedicated, professionalized group.

### **Puerto Rico**

In Puerto Rico, the fish trap fishery shows considerable heterogeneity. This heterogeneity is partly due to the island's large size (9,104 square kilometers), the difference in the width of the continental shelf on the northern and southern coasts of the island, intra-island conflicts (within Vieques, for example) and the patterns of settlement, among other factors. Consequently, trap fishers express different social concerns in various areas. Two examples illustrate these differences.

Many fishers on the island of Vieques off eastern Puerto Rico use fish traps. These and other fishers have traditionally argued for the end to the US Navy's bombing exercises off the island of Vieques, which was the major conflict in the recent past. They argued that the bombings killed sea life and destroyed sensitive habitats, prevented fishing trips, and slowed the development of Vieques. With the end to the bombings in 2002, the Viequesenses witnessed the establishment of the largest national wildlife refuge in the U.S. Caribbean: The Vieques National Wildlife Refuge (FWS 2003). While this does not represent a continuation of the same conflict that the fishers had with the US Navy, several believe that the renewed federal presence shall affect their ability to fish, among other activities.

In southeastern Puerto Rico, there is an extensive development project, including a series of condominiums, a golf course, and a marina, surrounding the incongruous fish house (*villa pesquera*) of Palmas del Mar (see Griffith and Valdés Pizzini, 2002, for an excellent description of *villa pesqueras*). While the Palmas del Mar fishers generally approve of the development, citing it as a means of alternative employment, several do believe that development has had a negative impact on their fishery. They feel that the increased boat traffic, competition from recreational fishers, and pollution from development have all decimated the local fish populations.

These examples demonstrate the differences in social concerns expressed by trap fishing communities across Puerto Rico, but they also point to a common theme: encroachment. Whether it is from competition from other gear, poaching from divers, development, or the establishment of closed or protected areas, the common theme in Puerto Rico is the encroachment on the trap fishers' way of life, resulting in the gradual decline of the fish trap as the dominant gear in the fishery.

## CONCLUSIONS

Each island presents its own sociocultural challenges to the local trap fishing community. In Puerto Rico, the fishers are affected by a myriad of issues, depending on their location, and these include impacts resulting from coastal development, competition from other gears and recreational fishers, poaching, and gear loss. The loss of fishing grounds, as related to the development of marine reserves, has been minimal in the Puerto Rican trap fishery. However, in the U.S. Virgin Islands, the recent development of several marine reserves has dominated the socioeconomic impacts on trap fishing. Often listed as one of the most important problems among respondents, Saint Thomas and Saint Croix fishers believe that they are being crowded into fewer grounds and slowly removed from the fishery via attrition.

The common theme that emerges from trap fishers in all regions in the US Caribbean is the perceived threat that they are being displaced from the fishery. This theme is similar to one identified in the Florida Keys lobster trap industry (Shivlani and Milon 2000), and it demonstrates the need for stakeholder groups to be incorporated fully in the management process. Often, trap (and other) fishers cannot differentiate between management actions originating from a variety of different agencies, even though they do suffer the cumulative

impacts. For example, many of the trap fishers interviewed in Saint Thomas perceive the closure of the Virgin Islands Coral Reef Monument as an extension of the Red Hind Marine Conservation District (MCD). Consequently, their views on fishery management measures are partly shaped by the former closure, which does not share the same objectives as the MCD. In order for management to be effective, it needs to be able to better explain and isolate its actions; otherwise, trap fishers (and other users) cannot be expected to either understand long-term strategies or to become meaningful participants in shaping the future of marine resource management.

#### LITERATURE CITED

- Appeldoorn, R.S., M. Nemeth, J. Vassilides, and M. Scharer. 2000. The effects of fish traps on benthic habitats off La Parguera, Puerto Rico. Report to the Caribbean Fishery Management Council, Hato Rey, Puerto Rico.
- Caribbean Fishery Management Council (CFMC). 1999. Amendment number 1 to the fishery management plan for corals and reef associated plants and invertebrates of Puerto Rico and the United States Virgin Islands for establishing a marine conservation district. World Wide Web Document. URL: [www.caribbeanfmc.com/mcd%20coral/MCD%20FMP.PDF](http://www.caribbeanfmc.com/mcd%20coral/MCD%20FMP.PDF).
- Federal Register. April 4, 2003. 68(65): 16432-16436
- Federal Register. November 4, 1999. 64(13): 60132-60133.
- Fish and Wildlife Service (FWS). 2003. Vieques National Wildlife Refuge Fact Sheet. World Wide Web Document. URL: <http://southeast.fws.gov/pubs/facts/vieques.pdf>.
- Griffith, D., and M. Valdés Pizzini. 2002. Fishers at work, workers at sea : a Puerto Rican journey through labor and refuge. Temple University Press, Philadelphia, Pennsylvania USA.
- Kittaka, J., and B. F. Phillips. 2000. *Spiny lobsters: Fisheries and Culture*. Fishing News Books. Malden, Massachusetts USA.
- Schärer, M.T., M.C. Prada, R.S. Appeldoorn, R. Hill, P. Sheridan, and M. Valdes-Pizzini. 2002. The use of fish traps in Puerto Rico: current practices, long-term changes, and fishers' perceptions. *Proceedings of the Gulf and Caribbean Fisheries Institute* 55:744-756.
- Shivlani, M.P., and J.W. Milon. 2000. Socio-cultural effects of a market-based fishery management program in the Florida Keys. *Coastal Management* 28:133-147.
- US Virgin Islands Coastal Zone Management Program (VICZMP). 2003. *Coastal Views* 2(5): 3.